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A new faunistical record of the genus *Typhonia* for Asia Continent (Lepidoptera, Psychidae)

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Abstract: A new faunistical record of the genus *Typhonia* for Asia Continent (Lepidoptera, Psychidae). *Misc. Pap.* 199: 1-4, 7 figs.

Taxonomical positions of some *Typhonia* taxa are discussed. *Typhonia melana* is reported here from East Anatolia. DNA analyses and morphological structures of the species are evaluated. Abdominal skin of *Typhonia melana* and habitat are illustrated here for the first time.

Key words: *Typhonia melana*, Psychidae, Lepidoptera, fauna, Turkey, DNA, morphology, genitalia.

The genus *Typhonia* was established by Boisduval in 1834 with the type-species *Bombyx lugubris* Hübner, by monotypy. Several generic names have been synonymized by various authors subsequently.

In the year of 2012, the authors observed and collected one male and one female of *Typhonia* at the same place but on different dates from the rocky slopes of Artos Mountain (Van Prov., East Turkey). The male was captured by the glandular hairs on the stalk of a kind of yellow-flowered Daisy plant (**Fig. 1**).

Last year, the author listed this species as “*Typhonia lugubris*” in a faunistic publication of Van Province, without explanation (Kemal & Koçak, 2018). In order to understand the correct status of Van specimens, they were recently barcoded (658 bp). The analyses show clearly that these two specimens belong to the same species, not to “*lugubris*”, but “*melana*”. Indeed, the genetic distance between the Italy population of *Typhonia melana* and our *Typhonia* was 0.46%. It means that our specimens appear to be typical *Typhonia melana* members at the molecular level. Furthermore, the genetic range between Italy population of *Typhonia ciliaris* and our *Typhonia* was 2.99-3.49% (Kimura, 1980; Tamura *et al.*, 2013). This means that *Typhonia* specimens from Van do not have genetic linkages with *ciliaris* at species level. After taking the morphological features into consideration, we came to the conclusion that *Typhonia* species from Artos Mountain belongs clearly to *Typhonia melana* Friv. Details and further evaluations are given below:

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Typhoniinae Lederer, 1853

Synonyms: Typhoioidea Lederer, 1853; Melasinidi Tutt, 1900

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Typhonia Boisduval, 1834*Typhonia* Boisduval, 1834, *Icones hist. Lépid. Nouv. ou peu connus* 2: 88. Type-species: *Bombyx lugubris* Hübner, [1808], by monotypy.Synonyms: *Coracia* Hübner, 1819 nec Brisson, 1760 (Aves), *Melasina* Boisduval, 1840, *Melapsyche* Kozhanchikov, 1956.**Typhonia melana Frivaldski, 1838***Typhonia melana* Frivaldski, 1838, *Magyar Tudos Tarsagad Evkönyve* 3: 171, pl.1. fig.1 Type: Hungary (NHM).*Typhonia ciliaris* (=melana): Amsel, 1933, *Mitt. dt. ent. Ges.* 4: 139.*Melasina lugubris* (=melana): Kozhanchikov, 1956, *Fauna UdSSR, Psychidae* [in Russian]: 163.*Typhonia ciliaris melana*: Sauter & Hättenschwiler, 1991, *Nota lepid.* 14: 78.*Typhonia ciliaris melana*: Sobczyk, 2011, *World Catalogue Insects* 10: 329.*Typhonia melana* (=beatricis): Arnscheid & Wiedlich, 2017, *Microlepid. Eur.* 8: 113-115 "Portugal, Spain, Italy, Austria, Bulgaria: Rhodope Mts., Balkan peninsula, Slovakia, Greece, Romania".*Typhonia lugubris*: Koçak & Kemal, 2018, *Priamus* 17 (1): 96, nr.2627 [without locality].

Brief description: Wings developed in both sexes. Middle sized moths. Male (**Figs. 1, 4**): wingspan: 24mm. Antenna bipectinate. Forewing elongate, densely scaled. Ground colour dark brown with pale, creamy patterns. Hindwing blackish without pattern. Female (**Figs. 2, 5**): wingspan 28mm. Antenna almost filiform. Both wings dark brown without light pattern. Anal tuft with dark brown hairs. Male genitalia: Normally three dimensional. The genitalia and the abdominal skin are illustrated from the preparation (GP3161♂) (**Figs. 6, 7**).

Material studied: 1♂. East Turkey: Van Province, Artos Mts. 2065m, 11.viii.2012, M.Kemal & A.Koçak leg. [LepDNA Psc 02-Cesa] - 1♀. from same place, 14.viii.2012, M.Kemal & A.Koçak leg. [LepDNA Psc 01-Cesa] (Cesa)

Discussion: According to the published data, There is a single *Typhonia* species in Turkey, i.e., *Typhonia punctata* H.-S., [1854] Although this species was originally described from "Kleinasien", based upon a single male collected by H.M.Wagner, its exact locality is unknown. In the Lepiforum, two males as "*Typhonia punctata*" were illustrated from Bursa Prov., Uludağ.² We have no more distributional information about *punctata* than Uludağ. The present taxonomical status of *punctata* is also unknown from the molecular standpoint.

The taxonomical status of *ciliaris* and *melana* in Balkan countries was uncertain for many years. The name *melana* was originally proposed by Frivaldski as a distinct species. However, its validity as a distinct species was not accepted by some authors. They considered it as junior synonym of *ciliaris* or *lugubris*. Other authors treated *melana* as a subspecies of *ciliaris*. Finally, Arnscheid & Weidlich (2017) solved this confusion, and proposed again *melana* as distinct species.

Now, the DNA analysis reveals that there is no serious difference between *Typhonia* from Artos and *Typhonia melana* from Italy. Moreover, external morphology of Artos specimens look like to *Typhonia melana*. In this case, the presence of *Typhonia melana* in Van Province is geographically a new record for Turkey, as well as Asia Continent. Other 55 *Typhonia* species in Asia are listed in the footnote.³

² http://www.lepiforum.de/lepiwiki.pl?Typhonia_Punctata

³ Other 55 *Typhonia* species mostly from tropical Asia as follows (Sobczyk, 2011: 322-348); *accurata* Meyrick (India), *alla* Zolotuhin & Prokovjev (Russia), *anarmosta* Diakonoff (Philippines), *anasactis* Meyrick (Sri Lanka), *autochthonia* Meyrick (India), *autopetra* Meyrick (Sri Lanka), *autadelpha* Meyrick (Myanmar), *campestris* Meyrick (India), *certatrix* Meyrick (India), *ciliaris* Ochsenheimer (...Iran), *coagulata* Meyrick (India), *cremata* Meyrick (India), *deposita* Meyrick (India), *devincta* Meyrick (India), *energa* Meyrick (Sri Lanka), *epiclera* Meyrick (India), *expedita* Meyrick (India), *expressa* Meyrick (Sri Lanka), *exsecrata* Meyrick (India), *frenigera* Meyrick (Sri Lanka), *granularis* Meyrick (Sri Lanka), *gregaria* Meyrick (India), *imparata* Meyrick (India), *infensa* Meyrick (India), *isopeda* Meyrick (India), *jactata* Meyrick (India), *korbi* Rebel (Russia), *kuldjaensis* Caradja (Uighur Ili), *leucosceptra* Meyrick (Sri Lanka), *lignosa* Meyrick (India), *meliphaea* Meyrick (India), *metherca* Meyrick (Sri Lanka), *multiplex* Meyrick (India), *multivenosa* Kozhanchikov (Russia), *nota* Meyrick (India), *obtectans* Meyrick (India), *ochrocoma* Meyrick (Myanmar), *onthostola* Meyrick (India), *paraclasta* Meyrick (India), *paulusella* Caradja (Palestine), *phaeogenes* Meyrick (India), *pericrossa* Meyrick (India), *platyzona* Meyrick (Sri Lanka), *praecepta* Meyrick (India), *ptyalistis* Meyrick (India), *punctata* Herrich-Schaeffer (Turkey, Georgia), *ramifera* Meyrick (India), *rhythmopis* Meyrick (Andamans), *semota* Meyrick (India), *stratifica* Meyrick (Sri Lanka), *subacta* Meyrick (India), *tetraspila* Meyrick (Sri Lanka), *troughti* Amsel (Jordan), *tylota* Meyrick (India), *vorticosa* Meyrick (India).

Other interesting *Typhonia* species is *ciliaris* Ochsenheimer. This species inhabits in Balkan countries like *melana*. However, *ciliaris* is also represented in North Iran. Osthelder (1938) described a species, “*Melasina aequalis*” from North Iran. Later, Petersen (1957) synonymized *aequalis* with *ciliaris* morphologically. Currently, *Typhonia ciliaris* is not found in Turkey.

Ecologically, the adults of *melana* in Turkey are diurnal. Flight time in August, at the upper heights of the mountains located *Astragalo-Brometea* vegetation cover in Irano-Turanian zoogeographic zone (**Fig.3**).



Figs. 1-3 - *Typhonia melana*. Male was caught by sticky secretion of glandular hairs of the plant (top left). Female as resting on the flower of *Acantholimon* (top right). Irano-Turanian habitat: tragacanthic mountain steppe on the slopes of Artos Mountain (Van Prov., East Turkey), 11-14.viii.2012. M. Kemal (Cesa)



Figs. 4-7 - *Typhonina melana*. Upperside of male (top left). Upperside of female (top right). Male genitalia and abdominal skin (GP3161) (bottom). M. Kemal (Cesa).

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